

DAY ONE | ROOM ONE

HOW INDIGENOUS PRACTICES OF SELF-GOVERNANCE BE INTRODUCED INTO MODERN SOCIETY?

Although there are still examples of traditional self-regulatory, self-management and self-governing practices around the world, and modern examples exist for firms, civic and sporting organisations there is no educational institution where this knowledge is taught. To avoid further degradation of our planet and its biodiversity there is an urgent need to format both traditional and system science knowledge in suitable forms to be disseminated through multiple channels around the planet. Traditional Australians have the longest continuous track record of indigenous practices. But other traditional cultures and system scientists could also provide alternative and/or complementary contributions in presenting details, practices and processes for knowledge dissemination. An outcome driven by distributed bottom-up decision making that is alien to authoritarian societies and democracies dominated by centralised command and control hierarchies not found in pre-modern societies. Education courses exist in Australia on how to teach Aboriginal general knowledge and recognise the various ways of sharing traditional knowledge but they do not seem to be focussed on if traditional knowledge and practices can contribute to mitigating and/or reversing the growing existential environmental threats. These arise from ever increases in population, declining bio diversity and the degradation of soils, oceans and atmosphere. The complex inter-related multidimensional existential threats from these problems require citizen led bottom-up solutions guided by top-down collaborations. While a number of institutions now teach about traditional knowledge none are known to suggest that it can make crucial contributions to modern society. Neville Namarnyilk sees the need to reverse the modern mindset to exploit the environment to become its steward. The PhD research of Tyson Yunkaporta on 'Aboriginal Pedagogies at the Cultural Interface' is particularly relevant as are the credentials in education of Anne Poelina. The PhD research of Shann Turnbull established the science of governance in any species.

SPEAKER BIOGRAPHIES



SHANN TURNBULL

Shann Turnbull PhD graduated as an electrical engineer in Tasmania, a Melbourne University BSc, Harvard MBA and a PhD from Macquarie University, Sydney. He has been a serial entrepreneur founding new firms that included two public mutual funds and three firms that became public traded. His experiences as public company chair and/or CEO was increased by being founding partner in a private equity group that obtained control and re-organised eight public companies. He initiated and became a founding author of the first educational qualification in the world for company directors in 1975 when he published *Democratising the wealth of nations*. His bottom up reform proposals resulted in being

commissioned by the Australian Government to undertake the first economic analysis of Aboriginal Communities in 1977. He was invited to Prague in 1990 & 1991, and to Beijing in 1991 to advise on stakeholder privatization. His PhD research introduced bytes as a unit of analysis to establish the science of governance in any species. Shann has been a prolific author on reforming the theories and practices of capitalism by following the processes found in nature. Refer to **Bibliography/CV**



ANNE POELINA

Anne Poelina PhD is a Nyikina Warrwa (Indigenous Australian) woman in the Kimberley region of Western Australia. Poelina is an active Indigenous community leader, human and earth rights advocate, filmmaker and a respected academic researcher, with a Doctor of Philosophy, Master of Public Health and Tropical Medicine, Master of Education, Master of Arts (Indigenous Social Policy) recently submitted a PhD (Health Science) titled, 'Martuwarra First Law Multi-Species Justice Declaration of Interdependence: Wellbeing of Land, Living Waters, and Indigenous Australian People'. Signatory to the Redstone Statement 2010, she is a 2011 Peter Cullen Fellow for Water Leadership. In 2017, she was awarded a Laureate

from the Women's World Summit Foundation (Geneva), elected Chair of the Martuwarra Fitzroy River Council (2018), Adjunct Professor and Senior Research Fellow with Notre Dame University and a Research Fellow with Northern Australia Institute Charles Darwin University. Poelina is a Visiting Fellow with the Crawford School of Public Policy at the Australian National University, Canberra Australia Water Justice Hub to focus on Indigenous Water Valuation and Resilient Decision-making. Professional website: www.martuwarrafitzroyriver.org - ORCID: <https://orcid.org/0000-0001-6461-7681> - Personal website: www.majala.com.au



TYSON YUNKAPORTA

Tyson Yunkaporta PhD belongs to the Apalech Clan from Western Cape York and resides in Melbourne. In 2019, he was a senior lecturer at Monash University in Indigenous Knowledges and now teaches at Deakin University. He also carves traditional tools and weapons, and is a published poet. In 2019, he published the non-fiction *Sand Talk: How Indigenous Thinking Can Save the World*. His PhD research at James Cook University was on 'Aboriginal Pedagogies at the Cultural Interface'. Other publications are: 2021, 'All our landscapes are broken: right story and the law of the land', *Griffith Review*, no. 72, Special issue: states of mind, pp. 1-1; 2018, *No Cure for the Colour Blind* "That serpent rainbow",

Australian Poetry Anthology (p. 59); 2017, *First Law* "Systems isolated, closed, vacuum", *Australian Poetry Journal*, vol. 7 no. 1, (p. 21); 2017, 'I'm Part of the World's Oldest Living Culture, But Could I Kill a Zombie with a Boomerang?' *The Guardian Australia*, 27 September;



NEVILLE NAMARNYILK

Neville Namarnyilk is an indigenous man of the lightning totem from Kunbarlanjja (Oenpelli) in the Northern Territory. He is an artist who speaks eight indigenous languages as well as English. He was educated in both traditional and modern realms. He is a schoolteacher, tour guide and a film actor in *High Ground*.

PROFESSOR NORM SHEEHAN

Professor Norm Sheehan is a Wiradjuri man born in Mudgee, New South Wales. Norm's expertise is based on *Respectful Design*; a practical non-violating way for identifying and activating cultural strengths within Indigenous communities as a basis for relevant and wellbeing enhancing education and research. He is currently Honorary Professor at the University of Queensland (UQ), Co-chair of the Vice Chancellor's University of Queensland Reconciliation Action Plan Oversight Committee, member of the UQ Education Advisory Council, and expert advisor Indigenous Research to the UQ Human Research Ethics Committee. Norm is currently in receipt of philanthropic funding to conduct cultural cohesion research in urban Aboriginal contexts.



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THE SOCIAL 'GLUE:' ALTERNATIVE CONSIDERATIONS FOR CREATING EFFECTIVE CIRCULAR ECONOMY HUBS

AUTHOR: Carolyn Cameron FIANZ

As Australian food and agribusiness are rebuilding after the sequential shocks of drought, bushfires, floods and a global pandemic, alternative business models such as clustering and embedding circular economy principles are increasingly on the agendas of industries, governments and communities. While the literature in geography, regional science and economic development is rich with the physical, logistical and technological attributes of effective circular economy hubs and clusters, researchers have paid less attention to soft infrastructure – the 'social glue' (Porter, 1998) needed for high performing clusters. What is needed, in addition to understanding and applying the principles of a circular economy, is proactive consideration of the social dimensions required to underpin an effective economic cluster. One major consideration is understanding the current and preferred positioning along a continuum from competition to collaboration. The Food and Agribusiness Growth Center, trading as Food Innovation Australia Limited (FIAL) has recognised the limitations of 'hard' science and planning prescriptions and has compiled a Good Practice Guide showcasing a range of potential 'social' dimensions likely to contribute towards effective food and agribusiness clusters. Seven social dimensions for more effective clusters are described. There is no right or wrong application of the dimensions, only the provision of optional good practice guidance to assist decision makers as they come together to create clusters or build circular economy precincts.

SPEAKER BIOGRAPHY



CAROLYN CAMERON

Carolyn Cameron has over 40 years' experience in environmental and strategic planning working with the mining industry, universities, state and national governments. She has worked in six states and territories in Australia, including developing on-line Masters-level courses, regional service delivery roles with the NSW EPA, and later with the Department of Primary Industries in Victoria, where she was a member of the North East Catchment Management Authority. More recently Carolyn was a Senior Executive with the national Department of Environment, leading teams to undertake strategic environmental and cumulative impact assessments across the country. Since 2015 she has been a senior

consultant on complex environmental management projects, applying her skills in policy analysis, cumulative and strategic impact assessment, stakeholder engagement and strategy development with local and state governments, Departments of the Australian government, the Great Barrier Reef Marine Park Authority (GBRMPA), Jacobs and Food Innovation Australia Limited (FIAL). In all her roles, Carolyn has focused on working with industry and community stakeholders to develop and deliver practical strategies that incorporate good practice combined with grass roots input.



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MUSEUM OF UNDERWATER ART: LINKING SCIENCE WITH ART, EDUCATION AND COMMUNITY

AUTHORS: Rachelle Brown, Adam Smith, Gemma Molinaro, Al Songcuan, Nathan Cook

The Museum of Underwater Art (MOUA) is an innovative project combining underwater art, research and education in the waters around Gurambilbarra (Townsville), Queensland. The project increases knowledge, education, stewardship, tourism and conservation of the Great Barrier Reef. The first stage was installed in November 2019. 'Ocean Siren' is a large intertidal sculpture of an indigenous girl that changes colour and links art and culture with climate change. Coral Greenhouse is a 160 tonne, 12 x 6 x 7m stainless steel and concrete sculpture located 37Nm offshore at John Brewer Reef. It is a submerged sculpture in 18m of water and showcases reef restoration. Two more stages are proposed: Stage 2 at Bwgcolman (Palm Island) and Stage 3 at Yunbenun (Magnetic Island). Citizen science initiatives at MOUA engage the community with the artworks and the reef. In March 2021, a team of volunteers installed coral transplants in the artworks. These corals will increase the aesthetics of the area as well as attract wildlife. A pilot indigenous training program increased diving, boating, science and tourism skills and has led to jobs and further training programs. The sculptures and the associated reef issues have reached an audience of over 400 million people through over 400 news articles, social media and tourism.

SPEAKER BIOGRAPHY



RACHELLE BROWN

Reef Ecologic specialises in providing expert advice to design and implement innovative solutions to environmental challenges facing tropical marine ecosystems and the people who love and depend upon them. They bring over 40 years of experience at the leading edge of coral reef science, management and policy to provide insight, guide strategic actions and build capacity among the leaders of today and tomorrow to secure a more sustainable future. Reef Ecologic have implemented major projects in all the coral reef regions of the world. They are united by their love of coral reefs and a conviction that the considerations, decisions and actions they take can make a meaningful and enduring

difference to the future of coral reefs



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NOOSA YOUTH ACTION ON CLIMATE CHANGE

AUTHORS: Claudia Baldwin, Gary Pickering, Kate English et al

Today's young people are forming their worldviews and will be tomorrow's leaders making decisions about transitioning to a low-carbon future to deal with environmental and societal consequences of climate change. Many have 'eco-anxiety' about the future so need clear science to support and empower them to take action. This presentation presents outcomes of an online survey of Noosa youth to identify their knowledge about causes and mitigation about climate change, their level of concern and preparedness to take action. It found that 85% believe climate change is real, and most trust information provided by scientists more than other sources, but less than half understand the most effective mitigation actions. The information was used to design a Noosa Youth Climate Summit held in August 2021, at which secondary school students (grades 9-12) identified climate mitigation actions to champion with their families, schools, Council and beyond.

SPEAKER BIOGRAPHY



CLAUDIA BALDWIN

Professor Claudia Baldwin (PhD UQ) is Co-Director of the Sustainability Research Centre and teaches Urban Design and Town Planning at University of the Sunshine Coast. Her research interests focus around engaging communities for change. She specialises in using participatory and visual methods to research institutional and social-environmental change and consensus-building on topics as diverse as water, coastal, rural and regional land use planning and management; and climate change adaptation; as well as affordable housing and ability and age-friendly communities. Her co-edited book with Lukasiewicz, *Natural Hazards and Disaster Justice: Challenges for Australia and its Neighbours* (2020) addresses

risk, resilience, participation, and justice related to disasters.



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SCIENCE - AS GOOD AS THE HUMANS WHO PERCEIVE IT: LIMITATIONS OF 'GOOD SCIENCE' IN THE FACE OF SUBJECTIVITY (CASE STUDY FAKE NEWS)

AUTHOR: Michele Hartz

Perhaps our greatest modern limitation and challenge to producing 'good science' is how that science is perceived and interpreted by the public. We are all wrought with pre-existing subjectivity and Bias, which is only compounded by the subjective era of 'Fake News' in a seemingly "Post Truth" world. Born from predecessors such as sensationalism, propaganda, and 'yellow journalism'; the art of Dezinformatiya, or 'Fake News', has never been so imperative for scientists and scholars 'who must engage' with it (Garrett K.R., 2017). An engagement that is necessary to give the 'facts' of Science a place for greater and more effective action towards human progress and sustainability. But in order to achieve this- we must first understand how the publics' subjectivity and the onslaught of 'Fake News' is presently (and arguably) the greatest block towards Science reaching that pillar. This warrants further research into "how and why citizens become (and sometimes remain) misinformed about science" with "Fake News" at the helm- perpetuating the paradox of Fact vs Fiction (Dietram A. et. al., 2019). Anywhere from 67 to 80 percent of the public have been exposed to 'Fake News' and believe it is causing "confusion" (Watson A., 2021). A confusion with immense impact to our capacity to progress on key issues facing our sustainability presently and into future generations. We implore rigorous methodologies to minimise the effects of subjectivity when we create science. However, it is now time for science to turn to how we do this for the general public when they receive science. This takes us to the roots in our primal human behaviours, psychology, and biology. An evolutionary past and predisposition to the creation of rumours and lies and their perpetuation. This provides us with a pathway to combat public subjectivity putting science 'fact' ahead of fiction.

SPEAKER BIOGRAPHY



MICHELE HARTZ

Michele Hartz is an enigmatic public speaker who's passion for the environment has translated to a number of commercial projects, along with her own consultancy practice E Coefficient which helps lead businesses and projects on how to sustainably capitalize on making an Impact 4 Good. She has depth and expertise advising and coaching as a strategic sustainable specialist across LCA's, EMS's and helping businesses certify to ISO standards. She has worked closely with government and industry stakeholders in facilitating investments into Clean Technologies here in Australia and into her own 6 figure businesses as a hands-on entrepreneur. She has also held the pleasure of having lectured and taught at

Monash University for 'Cities in Sustainability'. Michele is sparked by the demands for innovation, the call for tenacity- and the challenge to align 'eco' inspiration commercial application bringing entrepreneurial and visionary qualities combined with board experience, directorship and startup experience to deliver out of the box, divergent, and inspiring sustainable projects.



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GLOBAL PREVALENCE OF CUMULATIVE EFFECTS CONCEPTS IN EIA LAWS AND THEORETICAL CONTRIBUTIONS TO POLICY AND DECISION-MAKING

AUTHOR: Rebecca Nelson, L.M. Shirley

Most modern-day environmental problems are cumulative environmental problems caused by the complex aggregation and interaction of numerous individual causes of harm, contributing to large scale problems from biodiversity loss to climate change. By providing a framework for assessing and responding to complex interactions between larger projects, environmental impact assessment (EIA) law is an important legal context for considering cumulative environmental problems, and an important way to translate science for assessing cumulative effects into decision-making. This research evaluates the theoretical importance of cumulative effects concepts for EIA law beyond its technical value, to its potential benefits of (1) encouraging deeper engagement with values embedded in decisions about EIA; (2) encouraging wider participation in EIA, and (3) paving the way for regulatory 'ripple effects' outside EIA, to typically unregulated activities. The research then investigates the presence of cumulative effects concepts in national laws around the world, multilateral environmental agreements, and the policies of large multilateral development banks, showing that cumulative effects considerations appear in an overwhelming majority of these contexts around the world. Not only nations, but also financiers and other private actors should consider project-level cumulative effects considerations an accepted international norm for policy and decision-making. Against a theoretical background, this prevalence highlights the potential for deeper implementation of cumulative effects provisions to deliver more significant benefits from EIA law for policy and decision-making than have previously been appreciated. Analysing the legal functions of cumulative effects concepts in a sample of national laws suggests that the most significant benefits would arise if cumulative effects were considered comprehensively throughout all stages of EIA (including screening and post-assessment), rather than being confined to the assessment stage alone.

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REBECCA NELSON

Rebecca Nelson is an Associate Professor of Melbourne Law School in Environmental Law and Water Law. Her research focuses on environmental and natural resources law and policy, with an emphasis on empirical research and practical solutions. Dr Nelson is an Australian Research Council DECRA Fellow (2018-2021), leading a project that evaluates laws regulating cumulative environmental effects across diverse resources around the world. From 2010-2014, she led the Comparative Groundwater Law and Policy Program, a collaborative initiative between Water in the West at Stanford University and the United States Studies Centre at the University of Sydney. The Program focused on empirical

research and stakeholder workshops to improve groundwater sustainability in the western US and Australia. Dr Nelson is an author of *Water Resources Law* (2nd ed, LexisNexis Australia) and over 40 other publications. Dr Nelson was the IAH (Australia)/National Centre for Groundwater Research and Training Distinguished Lecturer (2016) and the Law Council of Australia's Young Environmental Lawyer of the Year (2014), awarded for her contribution to water law and environmental law. Dr Nelson holds a Doctor of the Science of Law from Stanford University, a Masters in Law (Stanford) and Bachelor of Engineering (Environmental) and Bachelor of Laws (University of Melbourne).



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THE ROLE OF SCIENCE IN ENVIRONMENTAL IMPACT ASSESSMENT FOR EMERGING OFFSHORE WIND ENERGY PROJECTS IN AUSTRALIA

AUTHOR: Naomi Campbell, Development Director, Star of the South

Star of the South is Australia's first offshore wind project, proposed to be located off the south coast of Gippsland in Victoria. Offshore wind is one of the world's fastest growing renewable energy technologies. The global offshore wind sector is forecast to grow from around 30GW of installed capacity today to 230GW of installed and committed capacity by 2030, as nations around the world look to their coastlines to expand their renewable energy capabilities. Star of the South has been leading the charge for offshore wind in Australia for several years. The project is in the feasibility phase with a range of scientific and site investigations underway since 2019, including wind and wave monitoring, marine mammal and bird surveys, fish studies and seabed mapping. Star of the South are progressing with numerous scientific assessments as part of its Environmental Impact Statement (EIS) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and the Environment Effects Statement (EES) under the Victorian Environment Effects Act 1978, some of which are a first for the Australian environmental impact assessment regime. This presentation offers environmental practitioners, regulators and industry the opportunity to learn about the importance of science, the complexities of collecting environmental data in data deficient areas (Commonwealth and State waters), and the need for a balanced approach to scientific assessment versus scientific research for EIA. What are the key learnings for the audience from your presentation? The speaker will share learnings on: - the importance of science – baseline data – Marine Ecological Survey Program to inform EIA - finding the balance between science for research and scientific assessment for the regulatory process of EIA - using science to understand acceptability for project (offshore wind) EIA

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NAOMI CAMPBELL

Naomi is leading the Star of the South approvals process including environmental assessment and landowner consultation in her role as Development Director. During her career, Naomi has successfully managed the approvals process on numerous energy projects totalling over 3GW of electricity. Working on some of the UK's largest offshore wind projects, Naomi has extensive knowledge of the project lifecycle of an offshore wind farm.



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ARE THREATENED ECOLOGICAL COMMUNITIES UNDER THE EPBC ACT SCIENCEY ENOUGH?

AUTHOR: David Francis

An integral feature of most definitions of the word 'Science' is that it involves a systematic approach to study or knowledge. From this we know that all scientific endeavor must be systematic. The Environment Protection and Biodiversity Conservation Act 1999 (the Act) is the Australian Government's key piece of environmental legislation. One of the matters protected under the Act are Threatened Ecological Communities (TECs). Most actions referred to the Australian Government under the Act relate to potential impacts on listed species or TECs. Given the important role the Act plays in the protection of TECs it is reasonable to expect that all aspects of their nomination, listing, description and assessment are based in science and should be systematic in their approach. Once nominated, the process of determining whether a community should be listed as a TEC follows a widely accepted scientific approach, however the nomination process is ad hoc and not systematic. While the Independent Review of the EPBC Act does not directly broach the nomination process of TECs, or how TECs are individually defined and described, it does identify there are issues across the Act pertaining to terminology and identifies that information is sometimes 'locked' in inaccessible formats. These are significant issues as they relate to the description, assessment and ultimate protection of TECs. In this paper I will identify a number of issues pertaining to the way TECs are described that do not accord with a systematic scientific approach and offer suggestions as to how these, and the nomination process, can be improved.

SPEAKER BIOGRAPHY



DAVID FRANCIS B.Sc (Hons) FEIANZ CEnvP

David Francis is the Director of Francisii Ecology and has over 28 years experience in environmental planning and ecological assessments across eastern Australia and PNG. Through this work David has been involved with a wide range of projects that grapple ecological and environmental conundrums. This has included several broad scale vegetation mapping studies in Queensland, NSW and Victoria using mapping systems of each jurisdiction and/or Threatened Ecological Communities listed under the *Commonwealth's Environment Protection and Biodiversity Conservation Act 1999*.



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WHAT DO TO WHEN SCIENCE AND POLICY AREN'T FULLY ALIGNED – SOME ANSWERS FOR THREATENED SPECIES IN CENTRAL QUEENSLAND

AUTHORS: Ailsa Kerswell & Julian Wall (2rog Consulting)

Ideally, scientific information would be deeply embedded and well aligned with policy development and implementation. However, policy development is often slow and not dynamic enough to incorporate new scientific information and ideas as they are developed. This situation is often experienced by environmental practitioners and their clients in central Queensland, where meaningful scientific information for threatened species has been developed over recent years, however policy documentation lags behind and integrating this scientific evidence into decision making is sometime challenging. This has negative consequences both for environmental impact assessment and also for driving improved biodiversity outcomes for threatened species. We are working across a number of projects to address these issues, including to understand and embed the latest scientific knowledge and techniques into impact assessments and conservation planning, as well as liaising with policy makers to review and refresh policy. Some examples that will be explored in this talk include, developing region-specific habitat definitions using the best available scientific information, raw data and expert elicitation; species habitat modelling using combined statistical and expert models; and impact assessment underpinned by detailed scientific research and monitoring. The outcomes of these projects include a contemporary, evidence-based understanding of where threatened species occur in the central Queensland landscape, the areas that may be most important for their persistence and improved outcomes of environmental impact assessment. The challenge of embedding the updated information in policy and gaining overarching acceptance from regulators for our novel approaches is ongoing. However, these principles and techniques are applicable across all parts of Australia and for any species or ecological community of interest. Applying them gives environmental practitioners opportunities to make best use of scientific information, whilst also pushing for better, evidence-based policy development and decision making.

SPEAKER BIOGRAPHY



AILS A KERSWELL

Ailsa and Julian are principal consultants and directors at 2rog Consulting, a small strategically focused environmental consulting company. Both have formal post-graduate scientific qualifications and now work to develop and apply ecological knowledge to achieve good environmental outcomes. Ailsa's current work focuses on undertaking landscape scale environmental assessments and encouraging both clients and regulators to make better environmental decisions. She is involved in numerous advisory groups and is passionate about cross-sector collaboration to achieve outcomes both for people and the environment. Julian also thinks big and has considerable experience in large scale

ecological assessment and strategic planning projects, particularly using spatial science and mapping techniques. His specialist expertise is in ecological condition assessments, monitoring, spatial analysis, climate change adaptation, and impact and risk analysis. He is also keenly aware of the interplay between human and ecological systems and strives to achieve pragmatic, sensible and sustainable solutions for the environments and communities with whom he works. Ailsa is based in south-east Queensland and Julian on the NSW mid-north coast.



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EFFECTIVE SEAs? SCIENCE IS ONLY PART OF THE PICTURE

AUTHORS: Jenny Pope MEIANZ, Tanya Burdett MEIANZ, Naomi Maxwell David Blair MEIANZ, Richard Morgan MEIANZ

Theoretical Framework for SEA Effectiveness Review Facilitating non-science input: effective public participation in SEA Incorporating science into implementation: What makes for good strategic assessment implementation architecture? Science and SEA- The essential ingredient in the development of Renewable Energy Zones in Australia Beyond Science: Incorporating SEA into New Zealand's new environmental legislation Panel discussion exploring effectiveness elements and limitations on the role of science that emerged in the presentations However, these principles and techniques are applicable across all parts of Australia and for any species or ecological community of interest. Applying them gives environmental practitioners opportunities to make best use of scientific information, whilst also pushing for better, evidence-based policy development and decision making.

SPEAKER BIOGRAPHIES

CAROLYN CAMERON

Carolyn Cameron has over 40 years' experience in environmental and strategic planning working with the mining industry, universities, state and national governments. She has worked in six states and territories in Australia, including developing on-line Masters-level courses, regional service delivery roles with the NSW EPA, and later with the Department of Primary Industries in Victoria, where she as a member of the North East Catchment Management Authority. More recently Carolyn was a Senior Executive with the national Department of Environment, leading teams to undertake strategic environmental and cumulative impact assessments across the country. Since 2015 she has been a senior consultant on complex environmental management projects, applying her skills in policy analysis, cumulative and strategic impact assessment, stakeholder engagement and strategy development with local and state governments, Departments of the Australian government, the Great Barrier Reef Marine Park Authority (GBRMPA), Jacobs and Food Innovation Australia Limited (FIAL). In all her roles, Carolyn has focused on working with industry and community stakeholders to develop and deliver practical strategies that incorporate good practice combined with grass roots input.

DR JENNY POPE

Dr Jenny Pope has over 30 years' experience in the fields of environmental management and sustainability, in Western Australia and internationally. She is currently a member of the Environmental Protection Authority (EPA) of Western Australia (appointed November 2018), and Director of Western Australian consulting firm Integral Sustainability, which works with business and government to integrate sustainability objectives and strategies into decision-making processes and operational practices. Jenny also holds a number of active academic positions; she is Extra-ordinary Associate Professor in Environmental Management at North-West University in South Africa and Fellow of the University of Cambridge Institute for Sustainability Leadership in the UK, where she teaches, researches and supervises Master's and PhD students. Jenny has qualifications in chemical engineering and public policy and commenced her career as an environmental process engineer in the water and the oil and gas industries, before establishing her consultancy business. She has particular experience in impact assessment in all its forms, sustainability planning and assessment, environmental management systems and environmental policy.

TANYA BURDETT

Tanya Burdett is a Registered Planner (Planning Institute of Australia), a member of the Institute of Environmental Management and Assessment EIA Quality Mark Panel and has been involved in a range of policy to project level environmental assessments throughout her 26-year career in a range of sectors – marine and coastal planning, urban development, roads and rail, energy and minerals, water resources and waste water management. A PhD Candidate, with consultancies in the UK and Australia, Tanya is passionate about capacity building, and as a licensed International Association for Public Participation trainer, has delivered training globally since 2009 and to 500+ participants from over 65 countries

NAOMI MAXWELL

Naomi Maxwell is an ecologist with qualifications in biodiversity conservation and law. She has over 15 years' experience providing strategic environmental and policy advice in both the public and private sectors. Over her career, Naomi has led multi-disciplinary teams to deliver: strategic assessments in most Australian jurisdictions; cumulative environmental impact assessments; regulatory approvals under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act); and comprehensive public policy reforms. Naomi is uniquely positioned as one of the only Australian practitioners who has negotiated, designed, developed, assessed and implemented EPBC Act strategic assessments. Naomi was formally responsible for managing the implementation of the Melbourne Strategic Assessment for the Victorian Government. She has also recently developed strategic assessment policy for the Australian Department of Agriculture, Water and the Environment. Naomi is a former Executive for the then Australian Department of the Environment, including the A/Director of Strategic Policy responsible for designing EPBC Act regulatory reforms for the one stop shop for environmental approvals and as the A/Director of Parliamentary Services for three Australian Ministers for the Environment. Naomi is the director of Maxwell Strategic Consulting Pty Ltd. Her consultancy provides strategic environmental and policy advice to government and industry.

DAVID BLAIR

David is a Principal (Environmental Impact Assessments) in JBS&G's Melbourne office. He has a broad background with 20 years' experience in both technical and management functions across a variety of environmental projects. David has been involved in and led strategic environmental assessments, due diligence surveys, environmental impact assessments, environmental management plans, environmental management systems, environmental auditing, eco-tourism planning, and contaminated land assessment. David has experience in management of complex environmental impact assessment processes for both site specific and linear projects as part of a professional team where he brings environmental solutions to engineering challenges. David Blair has worked on projects across Australia, a number of African countries and Papua New Guinea where he has been engaged in projects as a strategic advisor, project director and project manager. David has practical experience in environmental legislative requirements of Australia, Papua New Guinea, South Africa, Zambia, Mozambique, Zimbabwe, Kenya, Uganda, and other African countries, as well as World Bank Environmental Performance Standards and the Equator Principles.



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FROM BUNSEN BURNERS TO CULTURAL BURNING: FINDING SHARED SPACE FOR INDIGENOUS KNOWLEDGE IN SCIENCE

AUTHOR: Clara Klemski

Knowledge in science is based on hypothesis and exactitude, including when it comes to commercialising output. Concurrently, in the context of raging bushfires and climate change there is increasing focus on the value and wealth of Indigenous knowledge in managing the environment now and for the future. However, there is often a disconnect between the claim to ownership of knowledge between two differing systems of understanding the environment, where Indigenous environmental management is based on a system of communal knowledge and stewardship, contrasted with a Western science tradition of individualism and protection of individual outputs through current intellectual property laws and attitudes. This paper explores how pathways can be found for ensuring that Indigenous knowledge is incorporated in scientific outcomes while also protecting its value system, for example, through use of protocols and recognition of Indigenous Cultural and Intellectual Property within scientific projects and, where relevant, eventual commercialisation with a view to knowledge sharing and respectful collaboration that is Indigenous-led.

SPEAKER BIOGRAPHY



CLARA KLEMSIKI

Clara is a senior lawyer with expertise in environmental law and policy as well as a background in intellectual property law. She has advised on copyright, trade mark registration, Indigenous Cultural Intellectual Property (ICIP) and moral rights and has conducted litigation in the Land and Environment Court in planning and environment law. Particular areas of interest include Aboriginal cultural heritage and Aboriginal land claim, and she recently prepared articles on the review of the Environmental Protection and Biodiversity Conservation Act 1999 reforms and incorporation of Indigenous knowledge. Clara holds a Master of Administrative Law and Policy from the University of Sydney,

and qualifications with honours in Law and Environmental Management from Macquarie University and a Graduate Certificate in Arts and Cultural Management from Deakin University.



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THE 'SPIRITUAL ASPECT' IN NATIVE TITLE AND ABORIGINAL HERITAGE COMPENSATION

AUTHOR: Tim Mellor

The laws relating to monetary compensation for loss of property rights and interests have always reflected and embraced concepts of objective measures and calculations. In many cases it is primarily mathematical. In relation to one aspect, this 'science' has definitely come up short. The recent judgment of the High Court of Australia in Griffiths -v- Northern Territory (the Timber Creek Case) sees a willingness on the part of our highest Court to recognise and compensate Native Title holders for the 'spiritual harm' arising from the loss of or impairment to Native Title rights and interests. This paper considers this totally novel development, which recognises the limitations to the traditional 'science' of compensation calculation. That concept is likely to have a broader application in consideration of issues such as the loss of or damage to sites of significant Aboriginal Heritage. The recent damage caused by mining interests to the ancient rock shelters at Juukan Gorge in the Pilbara provides an obvious example.

SPEAKER BIOGRAPHY



TIM MELLOR

Tim Mellor is a partner in the South Australian firm of Mellor Olsson and has been a member of EIANZ since its shortly after its foundation. For more than 25 years, Tim has been engaged in various aspects of the law relating to Native Title claims and determinations, and has been involved in most South Australian Native Title claim and determinations, including 24 consent determinations and the 14 claims presently before the Federal Court. He is a former President of the Law Society of South Australia and of the National Environmental Law Association. In 2020 and 2021 Tim was recognised by the publication "Best Lawyers in Australia", on selection by his peers, as "Lawyer of the Year" in

Planning and Environmental Law in Adelaide.



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DAY TWO | ROOM TWO

PANEL SESSION | WALKING THE TALK: INTEGRATING INDIGENOUS KNOWLEDGE IN ENVIRONMENTAL POLICY AND PRACTICE

To discuss examples of (and barriers to) learning and collaborative environmental management and base data which integrates multiple sources of evidence, including Indigenous knowledge; and thereby contribute to the EIANZ Reconciliation Action Plan and ideas for new directions in policy and practice, through listening to First Nations and non-Indigenous environmental practitioners.



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DAY TWO | ROOM THREE

HOW CAN WE USE SCIENCE IN CONSTRUCTION ENVIRONMENTAL MANAGEMENT

AUTHOR: Richard Sharp

Everyday in Australia and New Zealand, regulatory authorities are approving infrastructure projects and in doing so are invoking environmental management conditions on the construction phase of these projects. Are these regulatory authorities however considering the role of science and how it can underpin the conditions that apply to the construction of infrastructure. This paper considers these aspects and show cases some examples of where science is being used in construction environmental management and where improvements still need to be made by regulatory authorities.

SPEAKER BIOGRAPHY



RICHARD SHARP

Richard has over 35 years of experience in providing advice and expertise in his chosen areas of professional practice which includes: environmental risk assessment; environmental management planning; the application of environmental best practice to construction; and the monitoring and auditing of environmental compliance associated with the delivery of infrastructure projects such as roads, electricity generating facilities and water distribution pipelines.



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DAY TWO | ROOM THREE

SUSTAINABILITY - EMPOWERED BY DATA

AUTHORS: Jessamine Welsh and Fiona Bowie

Data collection and analysis in sustainability management allows us to make good decisions and communicate the breadth and extent of sustainable outcomes both possible and achieved when planning and building major infrastructure projects. This is important given the extent of major infrastructure construction currently in the Australian pipeline. Sustainability involves concepts that are long-term and holistic, and thus hard to translate into tangible concepts for project decision makers. Combined with a traditional, yet unfounded perception of 'sustainability costs money', sustainability managers become empowered to create positive value when using their scientific expertise in data management, analysis, translation and communication. Through collection of sustainability data (e.g. energy and materials use during construction), analyses can be completed to demonstrate the positive outcomes achieved through investment in project sustainability. The North Western Project Alliance has been delivering Level Crossing Removal Projects across Melbourne for 4 years. We have collected data from four completed projects, including High St Level Crossing Removal Project, the first train station to be awarded a 5-star Green Star As Built rating in Australia. This data is put into action in three ways. This data is firstly used to demonstrate clear sustainable environmental, social and economic outcomes. Secondly, it facilitates data driven decisions, through multi criteria analysis to determine focus areas on future projects. Thirdly, translation of sustainability data into value creation encourages project teams to continue to improve on their achievements. The use of data has enabled our team to better understand where our greatest influence lies, however we have only begun to scratch the surface of it's potential. Investment in new methods of data modelling and analysis software would result in even further improvements. The use of data in sustainability has not yet reached its limit of application and there are large opportunities for innovations and environmental benefit. ** Conditional - awaiting approval from LXP

SPEAKER BIOGRAPHIES



JESS WELSH

Jess is a sustainability professional with a passion for waste management and circular economies. She is currently working as a Sustainability advisor on the North Western Program Alliance working on the Level Crossing Removals Projects. She does this concurrently with external waste management consulting, working to find circular economies in waste streams. Jess also comes from a technical science and research background which gives her an analytical view of looking at sustainability issues and how to create constructive outcomes.

FIONA BOWIE

Fiona is a passionate Melbournian who uses her influence on major infrastructure projects to deliver thriving and resilient cities. She is currently the Sustainability Lead on the North Western Program Alliance working on level crossing removals. She has worked on energy, rail, road and pipeline infrastructure projects across Australia for over 12 years. Her projects have achieved exceptional sustainability outcomes; most recently GBCA awarded the High St Level Crossing project the first 5 star Green Star As Built train station in Australia. Fiona is an alumni of The University of Melbourne, with a BSc. and a MEnv. majoring in Sustainable Cities.



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DAY TWO | ROOM THREE

ESG IN ACTION: USING SCIENCE TO DRIVE ESG IMPLEMENTATION AT EVERY LEVEL

SPEAKER BIOGRAPHY



ADRIAN WHITE

Adrian is the APAC Regional Sector Leader, Built Environment at SLR Consulting and leads the Acoustics and Vibration offering across Asia Pacific. He has extensive experience working as a professional engineer with a specialisation in noise and vibration engineering on large scale environmental projects. Adrian has held various senior roles in technical delivery, management, and business strategy across large scale consulting engineering companies. Adrian enjoys working with clients to develop long term relationships built on a foundation of delivery, quality and trust.



MILES LOCKWOOD

Miles is the APAC Advisory Operations Manager and ESG & Finance Sector Lead at SLR Consulting. An EHS sustainability consultant with over 25 years' experience advising in environmental and social risk management, Miles specialises in sustainable development advisory for major capital projects. Miles has multi-sector experience in advising private sector development and financial institutions on E&S risk management for project finance under international standards, with clients including private companies, Equator Principles banks, state owned investment and development banks, export credit agencies and multilateral Development Finance Institutions (DFIs).



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DAY THREE | ROOM ONE

POLLUTION INCIDENT HYPOTHETICAL – LINKING SCIENCE FROM PROJECT PLANNING TO EMERGENCY RESPONSE TO STRENGTHEN ENVIRONMENTAL, SOCIAL AND BUSINESS OUTCOMES.

The Session will be moderated by Jenny MacMahon with respected panel members including Suanna Harvey (Senversa- Environmental Management Specialist), Natasha Reifschneider (ESA2- Environmental Planning and Assessment Specialist), Gabrielle Guthrie (Guthrie Legal- Environment, Planning and Compliance Lawyer), a Victorian significant infrastructure project proponent, and/or a Victorian EPA regulator. A brief overview of the development will be provided including the environmental planning and assessment history, regulatory context, organisation chart, key stakeholders, and mock site plan, will be provided. The development proponent is an ASX Listed company. The hypothetical scenario will involve a panel discussion about a sequence of events following a pollution incident (loss of containment) from a recently approved significant development. The loss of containment has resulted in water quality impacts on a nearby waterway. The moderator will question panel members and actively explore with the audience: • Emergency response including notification of key stakeholders. • The impact of a pollution incident on the environment, community and proponent's business. • The adequacy of the science supporting the environmental assessment of the potential impact of an unplanned pollution incident on the waterway during the project planning phase. • The effectiveness of the transcription of science from the environmental assessment into conditions of consent and environmental management and monitoring. • The role of consultants in the development and implementation of environmental management systems. • How the proponent has assessed compliance. • Actions that could have minimised regulatory action using science, such as real time monitoring. The Session will be concluded with linking science from environmental assessments with environmental management and compliance audits, to eliminate and/or minimise environmental impact and regulatory action.

SPEAKER BIOGRAPHIES



JENNY MACMAHON

Jenny is Director of MacMahon Consulting, a certified Lead Auditor, and certified Environmental Practitioner, with over 30 years of experience in environmental leadership, management, compliance and auditing. Jenny has successfully led large multi-disciplinary environmental teams for Tier 1 engineering and environmental consultancies and private companies; improved operational environmental performance; delivered projects that benefit communities and the environment; and mentored engineering and environmental professionals. Jenny has delivered projects throughout the project life cycle and has led independent environmental audits; developed and implemented environmental

management programs; improved business' compliance performance; and provided environmental advice to support business decision making. Jenny's insight and experience has been gained across a wide range of business sectors including transport and water infrastructure, resources, energy, chemical and waste industries. Jenny has been approved by the NSW Department of Planning, Industry and Environment and the NSW Environment Protection Authority to undertake Independent Environmental Audits and as an Environmental Management Representative for TfNSW projects; and has chaired steering committees for NSW State significant infrastructure projects. Jenny is a member of EIANZ and volunteers as a Primary Ethics teacher, teaching young people how to explore ethical dilemmas.



SUANNA HARVEY

Suanna is Principal Environmental Scientist / Epa Appointed Auditor. She is an EPA Victoria Appointed Auditor and environmental professional with over 25 years of experience in environmental auditing, risk and environmental management, compliance, impact assessment and EPA approvals. She leads Senversa's Environmental Management and Approvals team. As an EPA auditor, Suanna is called on to provide a high level of assurance to the Victorian public about the potential risk of harm to human health or the environment from pollution or waste. With a chemistry background, she also promotes data driven and evidence-based decision making. Suanna has undertaken

over 130 audits of industrial facilities within sectors including transport, oil and gas, mining and minerals processing, defence, chemicals, printing, paint, paper, automotive, general manufacturing, pharmaceutical, food and beverage, construction, landfills, water, wastewater and waste treatment facilities. In her work Suanna strives to provide a wholistic, accessible and practical approach to environmental management, and is interested in the interface between the environment, people and systems.



NATASHA REIFSHCNEIDER

Natasha Reifschneider is Principal - Environmental Planning & Assessment And Sessional Member Of Planning Panels Victoria. She is an environmental assessment and planning practitioner with over 22 years' experience in the management and delivery of impact assessment and environmental approvals for the industrial, utility and infrastructure sector. Natasha's technical area of focus is navigating environmental and statutory planning approvals for major projects and providing strategic advice on the development and delivery of projects, coupled with the development and delivery of community and stakeholder engagement programs. Natasha's core strengths are in management of

multidisciplinary teams, options assessment, statutory approvals, and consultation/ engagement. Prior to her career in consulting, Natasha previously worked in both State and Local Government in statutory approvals. Natasha is also a sessional member of Planning Panels Victoria on a casual basis to provide her technical knowledge and experience in planning and environmental assessment to the Minister for Planning. Natasha is a member of EIANZ and the Victorian Planning and Environmental Law Association (VPELA).

GABRIELLE GUTHRIE - PRINCIPAL EVIRONMENT, PLANNING AND COMPLIANCE LAWYER

Bio - to be provided.

VICTORIAN SIGNIFICANT INFRASTRUCTURE PROJECT PERSONNEL AND SENIOR VICTORIAN EPA REGULATOR

Bio - to be provided.



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DAY THREE | ROOM TWO

AS SURE AS CAN BE...: WHERE DO GOOD SCIENCE AND UNCERTAINTY MEET?

While science means rigour to most of us, how far is it reasonable to equate rigour with certainty? Using a Hypothetical scenario, this session will feature a panel of key stakeholders in a fictional but plausible proposal which is subject to impact assessment. In a setting similar to a Town Hall meeting, the panel will debate the project's challenges with respect to confidence in the prediction of impacts. Themes might include the role of data, the use of mathematical models, extrapolation, assumptions and adaptive management. With the engagement and assistance of the audience – as stakeholders in the proposal themselves – we will try to put some shape around how sure we can be, or we need to be. The panel will comprise invited speakers who will each adopt a role – as proponent, consultant, regulator, communicator, elected representative and NGO – and present a brief perspective on the constraints and opportunities associated with uncertainty, relative to the proposed development. The panel will then debate points of disagreement, and respond to progressive instalments of new information about the project, its environment and its potential effects. Using a modified “Revolving Conversation” or “Fishbowl” format, the audience will join the discussion and test the views of the panel. Subject to venue logistics, those participating virtually may also join the discussion. The session will close with a debrief of insights gained and lessons learned. The format offers the opportunity for issues around uncertainty to be explored in a safe, fun and imaginative setting. By drawing on the panel members' experience and the audience's healthy scepticism, we will test the boundaries of certainty, the application of the precautionary principle in an imaginary but probably recognisable world of vested interests, subjectivity and contention. We are sure we will learn something...

SPEAKER BIOGRAPHIES



JACK KROHN Senior Impact Assessor, Victorian Department of Environment, Land, Water and Planning

Jack Krohn is a Senior Impact Assessor at the Victorian Department of Environment, Land, Water and Planning, with over 30 years' experience in environmental impact assessment and environmental planning, and was recently appointed a Fellow Member of EIANZ. He has planned and co-conducted interactive sessions using Hypothetical scenarios at several IAIA conferences. Jack believes strongly in giving fellow professionals the opportunity to learn from each other and to find their own insights into the environmental challenges we meet daily in our work.



TANYA BURDETT Registered Planner

Tanya Burdett is a Registered Planner (Planning Institute of Australia), a member of the Institute of Environmental Management and Assessment EIA Quality Mark Panel and has been involved in a range of policy to project level environmental assessments throughout her 26+ year career in a range of sectors – marine and coastal planning, urban development, roads and rail, energy and minerals, water resources and waste water management. A PhD Candidate, Tanya is passionate about capacity building, and as a licensed International Association for Public Participation trainer, has delivered training globally since 2009 and to over 500 participants from over 65 countries.



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DAY THREE | ROOM THREE

BRINGING THE SCIENCE TO LIFE: APPLYING SOCIAL SCIENCE THROUGH SOCIAL IMPACT MANAGEMENT PLANNING

AUTHORS: Chris Mahoney, Dr Jillian Ash and Jessica Lew

Projects that transform the environment can catalyse social impacts, both positive and negative, for a broad range of stakeholders. In response to this, there are increased requirements and expectations for project proponents to develop and implement Social Impact Management Plans (SIMPs), particularly in the resources sector across Australia. In theory, SIMPs are to be developed in collaboration with affected and interested stakeholders in order to document social impact mitigation and benefit enhancement measures. As such, the SIMP has potential to be an important vehicle for ensuring projects effectively manage social impacts while delivering social value for multiple stakeholder groups. While the introduction of SIMPs has been considered an innovation in corporate and public policy, its implementation and efficacy has been varied. A key challenge in SIMP development is balancing and incorporating the multiplicity of stakeholder perspectives and interests due to the contested nature of many social topics and issues. Different stakeholders perceive and experience social impacts differently and as such may hold differing expectations to how the impact should be managed and monitored. The absence of recognising diverse stakeholder perspectives and expectations can limit the effectiveness of the SIMP and potentially risk the SIMP exacerbating impacts on select stakeholders. Drawing on our collective experience in delivering multiple SIMPs across Australia, we argue that SIMP development needs rigorous engagement with social science to enable the recognition and inclusion of diverse stakeholder perspectives. Social science can facilitate the understanding of subjective viewpoints or experiences of stakeholder groups through qualitative research methods, such as in-depth interviews, focus groups and ethnographic observation. Such recognition of diverse perspectives can lay the foundation for more accountable and effective SIMP practice.

SPEAKER BIOGRAPHIES



CHRIS MAHONEY Principal Social Scientist, SMEC

Chris Mahoney is SMEC's Principal Social Scientist. With over 20 years' professional experience, he is one of Australia's most experienced social impact and management planning professionals, having individually delivered more than 90 social impact assessments across multiple sectors. Chris has worked with proponents, governments and communities to design and implement extensive community development and social impact management plans, along with capacity building programs which have been instrumental in fostering community involvement, acceptance and support for projects. Chris has also been commissioned by government agencies and private sector proponents

as a subject matter expert in social science.



DR JILLIAN ASH Senior Social Scientist, SMEC

Dr Jillian Ash is a Senior Social Scientist at SMEC with over ten years' experience delivering social impact assessments, social impact management plans and other social research projects for diverse communities and clients, including in the resources, transport, water, climate change and international development sectors across Australia, Asia and the Pacific. Skilled in qualitative research, and with a strong commitment to bridge research, policy and practice, Jillian's approach to projects is to facilitate delivery of positive social outcomes for communities and stakeholders. Jessica Lew is a Social Scientist at SMEC with over two years' experience. Commencing her professional career at Queensland Government's

Office of the Coordinator-General as a Social Impact Assessment Officer, Jess has delivered comprehensive evaluations on social impact assessments and social impact management plans of resource and non-resource projects across Queensland. As such, Jess is acutely familiar with regulatory and good practice expectations towards social impact identification and management.



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DEVELOPING A SOCIAL SCIENCE FRAMEWORK FOR SIA FOLLOW-UP

AUTHORS: Dr Lara K. Mottee, Dr Richard Parsons, and Tanya Martin

The application of social science methods in SIA is an internationally-accepted best practice standard. Embodied in international and local guidelines, such as the recent NSW SIA guideline, SIA practitioners are also expected to apply social science research techniques and have training in the social sciences. While there are high standards for leading practices in SIA that have contributed to an improved quality of pre-approval reports in recent years, innovations in post-approval evaluation practices are still needed to support better SIA follow-up and learning, and proponent accountability. Institutional support is also required to facilitate good practices, including participatory (community-led) monitoring. Previous research undertaken by the co-authors suggests a greater emphasis on applying good social science in follow-up processes will encourage a more reflexive and unbiased approach to SIA. In particular, previous findings indicate that the application of both qualitative and quantitative methods (i.e. a mixed-methods approach) in developing adaptive management strategies for monitoring contributes to better outcomes for the people affected by major development projects. We consider the dimensions of a preliminary social science framework for SIA follow-up, within the NSW planning regulatory context. Using examples from different industry sectors, we identify key social thematic areas, which could inform development of performance indicators and development approval conditions, for ensuring that social outcomes can be effectively monitored and managed post-approval. Implementing such a framework could improve accountability for decision-making and lead to an improvement in the overall quality of SIAs produced, through capturing learning from monitoring outcomes.

SPEAKER BIOGRAPHY



DR LARA KATHERINE MOTTEE Impact Assessment Consultant

Dr Lara Katharine Mottee is an impact assessment consultant, lecturer and researcher. Her recently completed PhD research investigated improvements in the assessment and management of social impacts in Urban Transport-infrastructure projects. Prior to commencing her PhD, spent 12 years' in practice as an Environmental and Social Impact Consultant/Planner in Australia. She currently works as an SIA Consultant at the Department of Planning, Industry and Environment.



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DAY THREE | ROOM THREE

USING SOCIAL SCIENCE WELL IN ENVIRONMENTAL MANAGEMENT

AUTHORS: Helen Ross, Claudia Baldwin, Natalie Jones and Angela Dean

If environmental management is people management, the social sciences are essential. It is important to know how people think; why they behave as they do and how to influence them to act differently; how their environmental, social and cultural contexts influence them; and how very different stakeholders can best collaborate towards improving environmental management and environmental impacts. In this presentation we argue for and illustrate ways of going beyond simplistic ways of treating these topics. We consider bodies of theory, research methods and practice methods on thinking, behaviour, systemic understandings, and collaboration. In exploring people's thinking, we highlight mental models and values. In behaviour, we discuss both individual and collective behaviour change, drawing on group learning and community development approaches used in agriculture. For rich contextual understanding, we illustrate some participatory systems approaches, and advocate for some use of deep social methods such as immersion in communities and management settings. Towards best use of collaboration, we canvas the variety of approaches available for participation and collaboration in planning and management, including participatory approaches to generating knowledge and planning, collaborative environmental management methods such as co-management and multi-party collaborations, and co-design of new technologies.

SPEAKER BIOGRAPHY



PROF. EMERITUS HELEN ROSS

Prof. Emeritus Helen Ross, best known to EIANZ as the Managing Co-editor of the Australasian Journal of Environmental Management, has been working on social science aspects of environmental management for 35 years. Her interests include resilience, mental models, values, Indigenous management, collaboration and community development, particularly in integrated catchment and water management contexts. She is a Fellow of the Environment Institute of Australia and New Zealand. Professor Claudia Baldwin uses participatory and visual methods to research institutional and social-environmental change on topics as diverse as water allocation, coastal planning, rural and regional

land use, climate change adaptation and community resilience, as well as age- and ability- friendly communities. Dr Natalie Jones is an applied anthropologist who is dedicated to advancing the role of social science in natural resource management within interdisciplinary teams. Her research interests involve understanding how people perceive and interact with environmental systems. She has established a strong track record in applying cognitive constructs, including mental models and values, to explore how people make sense of and relate to their environment, particularly in relation to water resources. Natalie has an interest in designing and implementing participatory processes to support decision-making, and is building a research program around the social dimensions of regenerative agriculture. Dr Angela Dean is an environmental social scientist with expertise in how to foster engagement with conservation and sustainability initiatives. She has more than 15 years' experience leading social research and behaviour change projects across diverse sectors, including agricultural practice, conservation stewardship, catchment management, integrated water management, and citizen science. Her research explores perceptions of environmental challenges, identifies how psychosocial factors and social and environmental context can enable or constrain engaging with environmental issues, and examines the effectiveness of communication approaches to strengthen support for, and participation in environmental stewardship.



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DAY FOUR | ROOM ONE

HOW GOOD IS SOCIAL SCIENCE?

How good is 'Social Science'? Integration of social impact considerations can add considerable value to a project in business case development, planning, construction, operations, and into closure and transition phases where relevant. Social science practitioners recognize that, through the application of rigorous social research approaches and methods, improved project outcomes can be achieved that more closely meet community needs, align with community values, and result in better social outcomes and benefits at local and regional levels. This session draws on the perspectives of a range of social practitioners across Australian and New Zealand who are applying rigorous practices to improve the integration of social data and insights. These practices include innovative mechanisms and processes to enable the voices of stakeholders and communities to genuinely influence the identification, assessment, monitoring and management of social issues. If you are interested in participating in the session, please outline your objective and purpose – what was your key challenge? Please describe and reflect on how you have used social science approaches and processes to facilitate key project, operational, and social outcomes.

SPEAKER BIOGRAPHY



DR SHERIDAN COAKES Social Scientist

Dr Sheridan Coakes is a Social Scientist with a PhD in Psychology and has over 25 years' research and applied experience in the areas of social impact assessment, stakeholder engagement and community involvement. As a leader in her field, Sheridan has developed and refined a comprehensive approach to Social Impact Assessment practice that has been applied in numerous large-scale public and private sector development projects across Australia, in diverse sectors such as forestry, mining (open cut and underground), quarrying, oil and gas, renewable energy and linear infrastructure development. In the mid-1990s, Sheridan held a key role with the Commonwealth Government in the application of SIA in resource policy development. In 1997, she established Coakes Consulting, a specialist consultancy developed to address social and community issues within a resource management context. She currently holds the position of National Social Practice Lead with Umwelt Australia and is also a Convener of the SIA Community of Practice for EIANZ. Sheridan has a deep knowledge of planning legislation and policies and has worked in a range of planning contexts. She has a strong understanding of the 'public interest' and frameworks for integrating social evidence and issues into decision-making. In April 2021, Dr Coakes was appointed to the Independent Planning Commission on a three-year term.



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THE LIMITATIONS OF SCIENCE IN CUMULATIVE IMPACT ASSESSMENT

AUTHOR: Bryan Jenkins

Three case studies from water management in Canterbury are considered where there were limitations of science in assessing whether further development would exceed sustainability limits. The Lynton Dairy consent application for water from the Rakaia-Selwyn Groundwater Zone represented about 2% of total water consented in the Zone which was considered fully allocated. The allocation limit was based on flow reductions in groundwater-fed streams. However, the Council's decision to decline was challenged in the Environment Court which granted the consent on the basis that flow measurements have an uncertainty of $\pm 5\%$, thus there was no "probative evidence" of an adverse effect. The nutrient loading of land use intensification in the Ahuriri catchment affected the trophic status of Lake Benmore. Initial modelling indicated a catchment load of 173 tN/y compared to a limit of 256 tN/y for the lake to remain oligotrophic, i.e., implying some capacity for further intensification. However refined data used in later modelling revealed a nitrogen load of 253 tN/y and lake modelling was underpredicting nutrient concentrations, thereby indicating no capacity for further intensification. A cap on the annual nitrogen load for the Hurunui catchment was set at the current annual-average-load of 693 tN/y to manage periphyton growth in the river. However, there was a large annual variation (between 445 and 981 tN/y) and periphyton growth was not only related to nitrogen load but also the period between flushing flows in the river. Historically, the greatest periphyton cover occurred when the annual load was only 521 tN/y. To address the limitations of science, Canterbury introduced collective management responsibility for outcomes of cumulative effects. Farmer collectives need an approved Environmental Management system that defines water quality outcomes which are translated into individual Farm Environment Plans. Measurements of performance in relation to EMS outcomes and FEP actions are independently audited.

SPEAKER BIOGRAPHY



BRYAN JENKINS Sustainability Strategist

Bryan is a sustainability strategist. He is an adjunct Professor at the University of Adelaide. Previously he was Professor, Strategic Water Management at the Waterways Centre for Freshwater Management, a joint centre of the University of Canterbury and Lincoln University. He was chief executive of Environment Canterbury which is the regional council whose responsibilities include natural resource management. Before coming to Canterbury, he was chief executive of the Department of Environmental Protection in Western Australia. Prior to that, he had more than 20 years' experience in environmental management consulting throughout Australia, South East Asia, India and China. He

has a PhD in environmental planning from Stanford University, a masters and first-class honours degrees in civil engineering from Adelaide University and a master of administration from Monash University. He is the President of the Environment Institute of Australia and New Zealand.



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DAY FOUR | ROOM TWO

THE INTERSECTION OF INEQUITY: THE INTERSECTION OF SCIENCE AND POLICY

AUTHOR: Gareth Rees

The intersection of science and policy is an interesting space - often contested and conflicted. Issues and problems can at face value appear obvious and clearly defined and understood, at least defined enough to warrant the consideration of tweaks to existing or the development of new policy to correct the malady. Oftentimes there is available scientific evidence, analysis, and reason available to policymakers to inform their decisions. There are examples, both in the recent past and more historically, of where the convergence of science and policy has been timely. Equally, there are examples where the convergence did not occur optimally, and even more sadly, not at all. One can contrast the policy response to the Coronavirus pandemic to that of climate change to examine the successfulness and timeliness of the intersection of science and policymaking. An intersection is an apt analogy for the challenges to a convergence of science and policy, with different paths and routes in and out; representing the different forces, factors, and path dependency that can affect the way policy can be arrived at successfully, or not as the case may be. A flourishing and sustainable society requires robust and trusted science, good governance and the implementation of policy for society and the environment for our collective benefit. This paper will examine potential and actual convergences of science and policy, identifying barriers to policy success, opportunities for improvement in the integration of science in policy development, as well as considering the positive and negative impacts for the community where policy and science does or does not converge.

SPEAKER BIOGRAPHY



GARETH REES

Gareth Rees is a certified environmental practitioner with more than 15 years working in the delivery of infrastructure in Queensland and New South Wales. Throughout his career, Gareth has worked hard to understand the complex environmental, social and sustainability issues that are present in the delivery of projects. With a strong conviction for the protection of the environment, an empathetic approach to engagement with people and a curious mind to go beyond and look for the hidden side of things, Gareth is always looking to incorporate and implement different ways of managing and solving problems.



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PRACTICE, SCIENCE, AND POLICY: EXPLORING THE ISSUES

AUTHORS: Dr Mark Breitfuss and Patricia Dale

Science aims to enlighten ignorance or lack of knowledge. This is an issue in environmental management where, albeit innocent, lack of knowledge has the potential to lead to adverse effects because of ignorance. To reduce uncertainty, strong interrelationships are needed between three components of environmental management: science, policy, practice. Science is often considered the start of that sequence, perhaps because knowledge underlies all. The traditional science-to-policy pathway is often hampered by conflicting time scales, multiple jurisdictions, and semantics. Science is itself often hampered by lack of sufficient and timely resources to pursue the knowledge required by practice. It will be argued that a more environmentally sustainable result will be achieved if practice is at the start of the sequence driving the practical need for knowledge and providing support for achieving it. From the ground up, practice needs to be informed by science and so science needs to know what is needed by industry (practice). Practice also needs to be aware of policy and regulations, and regulatory bodies need to understand the practical issues of implementing policy. The final link is the science that can be relied on by policy makers who have been convinced by evidence that science-led outcomes are good bases for policy. We propose that better and more sustainable environmental management will result when practice (including industry) identifies the science needed to underpin practice and drives the process of acquiring the information by providing support and funding. This will establish direct efficient and effective links between science and practice. It also has the potential to provide information that will guide policy, thereby completing the connections between science, practice and policy. This presentation discusses the topic with reference to examples and proposes a panel-style discussion to convey the issues and promote debate.

SPEAKER BIOGRAPHIES



DR MARK BREITFUSS

Dr Mark Breitfuss graduated with a PhD in ecology in 2004 from Griffith University. His research was multidisciplinary, covering a range of ecological topics focussed on intertidal wetlands and environmental impacts. Since then, he has worked in the applied field of science and environment and is currently one of the Managing Directors at Epic Environmental. Epic began in 2015 to provide high-quality, specialist services to clients and it has continued to grow since then. Much of Marks' work is focused on the regulatory interactions between government and industry, particularly in the resources, water, energy and environmental sectors. Mark has been and is an active member of EIANZ. He has a

range of experience in the successful implementation of strategies required to gain regulatory approvals, improve performance, manage risk and deliver success to provide quality outcomes for clients.

PATRICIA DALE

Patricia Dale is a member of the Griffith School of Environment and Science at Griffith University, Queensland, Australia. Pat is committed to interdisciplinary research and its application to environmental management, with collaborations spanning a range of discipline areas over 35 years. Pat's major research focuses on saltmarsh and mangrove ecology and management. Her focus is on mosquitoes and their management and sustainable wetland management. Pat's research outputs include over 100 peer reviewed publications and a similar number of reports and conference proceedings. She has received numerous grants from National, State and Local agencies.



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ADDRESSING THE 'IMPLEMENTATION LAG' BETWEEN RESEARCH AND PRACTICE

AUTHOR: Dr Alan Chenoweth

The time-lag between the publication of research findings and implementation by practitioners in the field has been the subject of investigation and discussion in many fields and professions. In agricultural extension, it has long been recognised (since the American 'Dustbowl' era) that there are five 'adopter categories' – innovators, early adopters, early and late majority, and laggards; and this framework is still useful and used today with respect to IT adoption. However recent experience in the environmental disciplines (particularly climate change) indicate that a sixth 'Luddite' category may be appropriate for reactive 'resister/denialists'! For the professions of medicine and engineering (and related disciplines), there are considerable public safety benefits in quickly translating published research and conference papers into accepted practice as adopted by the profession, although lags may occur with respect to products (such as drugs, or scaling-up procedures and manufacturing to commercial level) or regulatory requirements. Additional delays are caused where practice is largely dependent on changes in government policy, because considerable time lags are involved in the progression from research and publication to policy then practice. Examples will be given, drawn from planning and environmental practice, where the implementation lag has been reduced (generally when the science is widely accepted and public safety may be affected), or frustratingly exacerbated because the science has been disputed or politicised, or there is little imperative to translate research into policy. This paper also examines the role of the environment profession, the importance of continuing professional development and up-to-date standards, and other implications for ethical competent practice.

SPEAKER BIOGRAPHY



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